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Multi-Period Portfolio Optimization Using Predictive Machine Learning Models

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Abstract : This paper integrates machine learning forecasting techniques into the multi-period portfolio optimization framework, enabling dynamic asset allocation based on multiple future periods. We explore both theoretical foundations and practical applications, employing diverse machine learning models for return forecasting. This comprehensive guide demonstrates the superiority of multi-period optimization over single-period approaches, particularly in risk mitigation through strategic rebalancing and enhanced market trend forecasting. Our goal is to promote wider adoption of multi-period optimization, providing insights that can significantly enhance the decision-making capabilities of practitioners and researchers alike.

Keywords : multi-period portfolio optimization, look-ahead constrained optimization, machine learning, sequential decision making
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